

ABSTRACT

Acoustic detectors having special arrangements and shapes which favor receipt of energy from a particular direction are presented for use in bio chemical concentration measurement. These detectors may include those which aim to receive acoustic energy from a portion of tissue lying slightly below the surface where interstitial fluid containing glucose and glucose indicators may be probed with middle infrared electromagnetic radiation. These devices may be arranged to listen not only to a particular direction in the tissue, but additionally to a particular chosen point. In some versions, acoustic detectors are formed of concentric ring elements having geometries which facility constructive interference between successive wave fronts of a received acoustic wave. Alternatively, spherically shaped reflecting surfaces may be used as a lens to couple the energy emitted from interstitial fluid to a transducer which lies at or near the skin surface.